

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-29. (Canceled)

30. (New) A method comprising:

receiving content for transmission from a plurality of transmit antennae, wherein the received content is a vector of input symbols (\mathbf{s}) of size $N_c \times 1$, wherein N_c is the number of subcarriers of the multicarrier wireless communication channel; and

generating a rate-one, space-frequency code matrix from the received content for transmission via the plurality of transmit antennae by dividing the vector of input symbols into a number G of groups to generate subgroups and multiplying at least a subset of the subgroups by a constellation rotation precoder to produce a number G of pre-coded vectors (\mathbf{v}_g), wherein successive symbols from the same group transmitted from the same antenna are at a frequency distance that is multiples of NG subcarrier spacings.

31. (New) A method according to claim 30, further comprising:

dividing each of the pre-coded vectors into a number of $LM \times 1$ subvectors; and

creating an $M \times M$ diagonal matrix $D_{\mathbf{s}_n, k} = \text{diag}\{\Theta_{M \times (k-1)+1}^T \mathbf{s}_g, \dots, \Theta_{M \times k}^T \mathbf{s}_g\}$, where

$k=1 \dots L$ from the subvectors.

32. (New) A method according to claim 31, further comprising:
interleaving the L submatrices from the G groups to generate an $M \times Nc$ space-frequency matrix.
33. (New) A method according to claim 32, wherein the space-frequency matrix provides MNL channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s) M , receive antenna(s) N and channel tap(s) L .
34. (New) A method according to claim 30, wherein the space-frequency matrix provides MNL channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s) M , receive antenna(s) N and channel tap(s) L .
35. (New) An apparatus comprising:
a diversity agent to receive content for transmission via a multicarrier wireless communication channel, wherein the received content is a vector of input symbols (\mathbf{s}) of size $Nc \times 1$, wherein Nc is the number of subcarriers of the multicarrier wireless communication channel, and to generate a rate-one, space-frequency code matrix from the received content for transmission on the multicarrier wireless communication channel from a plurality of transmit antennae by dividing the vector of input symbols into a number G of groups to generate subgroups and multiplying at least a subset of the subgroups by a constellation rotation precoder to produce a number G of pre-coded

vectors (\mathbf{v}_g), wherein successive symbols from the same group transmitted from the same antenna are at a frequency distance that is multiples of NG subcarrier spacings.

36. (New) An apparatus according to claim 35, the diversity agent further comprising:

a space-frequency encoding element, responsive to the pre-coder element, to divide each of the pre-coded vectors into a number of $LM \times L$ subvectors, and to create an $M \times M$ diagonal matrix $D_{s_g, k} = \text{diag}\{\Theta_{M \times (k-1)+1}^T \mathbf{s}_g, \dots, \Theta_{M \times k}^T \mathbf{s}_g\}$, where $k=L \dots L$ from the subvectors.

37. (New) An apparatus according to claim 36, wherein the space-frequency encoding element interleaves the L submatrices from the G groups to generate an $M \times Nc$ space-frequency matrix.

38. (New) An apparatus according to claim 37, wherein the space-frequency matrix provides MNL channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s) M , receive antenna(s) N and channel tap(s) L .

39. (New) An apparatus according to claim 35, wherein the space-frequency matrix provides MNL channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s) M , receive antenna(s) N and channel tap(s) L .

40. (New) A system comprising:
a number M of omnidirectional antennas; and
a diversity agent, to receive content for transmission via a multicarrier wireless communication channel, wherein the received content is a vector of input symbols (\mathbf{s}) of size $N_c \times 1$, wherein N_c is the number of subcarriers of the multicarrier wireless communication channel, and to generate a rate-one, space-frequency code matrix from the received content for transmission on the multicarrier wireless communication channel from at least a subset of the M omnidirectional antennas by dividing the vector of input symbols into a number G of groups to generate subgroups and multiplying at least a subset of the subgroups by a constellation rotation precoder to produce a number G of pre-coded vectors (\mathbf{v}_g), wherein successive symbols from the same group transmitted from the same antenna are at a frequency distance that is multiples of N_G subcarrier spacings.

41. (New) A system according to claim 40, the diversity agent further comprising:
a space-frequency encoding element, responsive to the pre-coder element, to divide each of the pre-coded vectors into a number of $LM \times 1$ subvectors, and to create an $M \times M$ diagonal matrix $D_{\mathbf{s}_g, k} = \text{diag}\{\Theta_{M \times (k-1)+1}^T \mathbf{s}_g, \dots, \Theta_{M \times k}^T \mathbf{s}_g\}$, where $k=1 \dots L$ from the subvectors.

42. (New) A system according to claim 41, wherein the space-frequency encoding element interleaves the L submatrices from the G groups to generate an $M \times Nc$ space-frequency matrix.

43. (New) A system according to claim 42, wherein the space-frequency matrix provides MNL channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s) M , receive antenna(s) N and channel tap(s) L .

44. (New) A system according to claim 40, wherein the space-frequency matrix provides MNL channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s) M , receive antenna(s) N and channel tap(s) L .